

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: TOBBEN, Bernardus Johannes

SERIAL NO.: 10/539,945

ART UNIT: 3672

FILED: January 17, 2006

EXAMINER: Wright, G. C.

TITLE: APPARATUS FOR THE COOLING OF DRILLING LIQUIDS

Amendment A: DRAWING AMENDMENTS

Please delete FIGURES 5 - 7.

There are no Replacement Sheets because the figures and pages have been canceled. There are a total of four (4) sheets of drawings for consideration on the merits. No new matter has been added.

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Amendment A: REMARKS

Upon entry of the present amendments, previous Claims 1 and 2 have been canceled and new independent Claim 3 substituted therefor. Reconsideration of the rejections, in light of the forgoing amendments and present remarks, is respectfully requested. The present amendments have been entered for the purpose of placing the claim language into a more proper U.S. format and for the purpose of more clearly distinguishing the present invention from the prior art.

In the Office Action, Claims 1 and 2 were now rejected under 35 U.S.C. § 103(a) as being unpatentable over the Skinner patent and Jaeger patent. The drawings were objected to because it was difficult to distinguish the different the elements in the Figures with all of the different lines shown in the Figures. The disclosure was objected to because of the lack of the description of each Figure number in the Brief Description of the Drawings and the lack of the element numbers in specification.

As an overview to the present reply, Applicant has revised previous Claims 1 and 2 in the form of new independent Claim 3. New independent Claim 3 expresses the original limitations in a more proper U.S. format, including proper antecedent bases and proper structural interrelationships throughout. Any indefinite terminology found in the original claim language has been corrected herein. In particular, since the previous claim language expressed functional relationships, Applicant

has provided herein proper “means-plus-function” terminology. Additionally, independent Claim 3 specifies that there is a “circulation pumping means” that passes the water and glycol mixture in a closed circuit between first and second heat exchanging means.

Applicant respectfully contends that the present invention, as defined by independent Claim 3, is patentably distinguishable from the prior art combination of the Skinner and Jaeger patents. In the Office Action it was stated by the Examiner that "Skinner discloses the method and apparatus of using a heat exchanger (31) to cool a drilling fluid." Applicant respectfully disagrees with this analysis. The main objective of the Skinner patent is the safe disposal of solid drilling cuttings (see column 1, lines 28 - 32 and 36 - 39). Therefore, the mixture of drilling cuttings, water and hydrocarboneous oils extracted from the wellbore is treated in a two stage process. In a first heat exchanger, this mixture is heated to a first elevated temperature thereby vaporizing substantially all water and a small amount of oil. The vapor thus produced is cooled in condenser 31 to liquefy the water and oil so as to allow a separation in separator 33. The cuttings and the main oil portion that are not vaporized in the first heat exchanger 20 are subjected to a second heat treatment at a temperature higher than the first elevated temperature in a second heat exchanger 21. The vaporized oil is condensed in condenser 48.

In the invention, the drilling mud cooler serves to cool the mud. The mud is a mixture of cuttings, water and oil. This mixture is warmed up approximately 10 to 15 degrees during a circulation. (See paragraph [0018] of the original specification). The mud cooler is cooled by seawater which, of course, is abundant at sea. However, in the present invention, in order to avoid contamination of the sea water in case of a leakage, the mud is not directly cooled by seawater. Instead, the cooling is performed in two heat exchangers having a common closed circuit wherein

a coolant (the glycol and water mixture) circulates.

In the condenser 31 of the Skinner patent, the risk of leakage due to the absence of cuttings is small. Therefore, there could be no suggestion, teaching or motivation to a person with ordinary skill in the art to provide a second heat exchanger in the condenser and connect the two exchangers by means of a closed loop wherein a glycol and water mixture circulates.

The Jaeger patent discloses an internal combustion engine having a closed cooling system using a primary coolant (ethylene glycol and water). The ethylene glycol and water coolant is cooled by seawater in a heat exchanger 26. The primary coolant directly cools the engine block through the cooling passages (see column 5, line 32). The leakage of oil into seawater is never an issue in Jaeger patent. Jaeger is solely directed to prevention of corrosion occurring in the drain area (see column 4, lines 12 - 19) by using different materials (see column 4, lines 32 and 33).

In contrast to the combination of the Skinner and Jaeger patents, the present invention provides a heat exchanging means wherein the hot drilling mud is cooled by the primary coolant in the first heat exchanging means. Thus, the present invention provides an element that is not shown nor suggested by the combination of Skinner and Jaeger patents. Quite clearly, the combination of the Skinner and Jaeger patents does not show the “circulation pumping means” for passing the water and glycol mixture in a closed circuit between a first heat exchanging means and a second heat exchanging means.

Applicant has previously, in the Preliminary Amendment, attached descriptions to Figures 1 - 7. Applicant has revised the specification herein so as to correlate those numbers that appear in the specification with the numbers that appear in the drawings. So as to avoid the confusion analysis identified by the Examiner, Applicant has canceled previous Figures 5 - 7. These previous Figures

5 - 7 are superfluous in the analysis of the present invention. Applicant respectfully contends that the reference numbers and lead lines clearly show the separate components of the present invention in a clear manner.

Based upon the foregoing analysis, Applicant contends that independent Claim 3 is now in proper condition for allowance. Reconsideration of the rejections and allowance of the claims at an early date is earnestly solicited. Since no new claims have been added above those originally paid for, no additional fee is required.

Respectfully submitted,

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Date

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